1-1-1993

Test 1665: John Deere 7600 PowerShift Diesel 19-Speed

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NEBRASKA OECD TRACTOR TEST 1665—SUMMARY 132
JOHN DEERE 7600 POWERSHIFT DIESEL
19 SPEED

Location of Test: Tractor Testing Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of Test: April 28 to July 19, 1993

Manufacturer: John Deere Tractor Works, P.O. Box 270, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 53.9 **Specific gravity converted to 60°/60° F *(15°/15°C)*** 0.8357 **Fuel weight** 6.958 lbs/gal *(0.834 kg/l)* **Oil SAE** 15W-40 **API service classification** SG/CE **To motor** 4.990 gal *(18.889 l)* **Drained from motor** 4.759 gal *(18.013 l)* **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere GL-5 Gear Lubricant **Total time engine was operated** 31.5 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger **Serial No.** *TO6068T379506* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** (as specified) 4.19" × 5.0" *(106.5 mm × 127.0 mm)* **Compression ratio** 17.2 to 1 **Displacement** 414 cu in *(6788 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and prestrainer **Fuel cooler** radiator for inlet fuel **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** two thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 43.2-46.3 lb/h *(19.6-21.0 kg/h)* **High idle:** 2225-2325 rpm **Turbo boost** nominal 8.7-10.2 psi *(60-70 kPa)* as measured 9.0 psi *(62 kPa)*

CHASSIS: Type front wheel assist **Serial No.** *RW7600P-001870* **Tread width** rear 59.8" *(1518 mm)* to 100.3" *(2548 mm)* front 60.0" *(1524 mm)* to 88.0" *(2235 mm)* **Wheel base** 110.2" *(2800 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph *(km/h)*** first 0.94 *(1.51)* second 1.34 *(2.16)* third 1.68 *(2.71)* fourth 2.04 *(3.28)* fifth 2.35 *(3.78)* sixth 2.67 *(4.29)* seventh 3.08 *(4.95)* eighth 3.66 *(5.89)* ninth 4.22 *(6.79)* tenth 4.78 *(7.70)* eleventh 5.51 *(8.87)* twelfth 6.33 *(10.18)* thirteenth 7.29 *(11.73)* fourteenth 8.27 *(13.31)* fifteenth 9.53 *(15.33)* sixteenth 10.67 *(17.17)* seventeenth 13.20 *(21.24)* eighteenth 18.43 *(29.66)* nineteenth 22.82 *(36.72)* reverse 1.51 *(2.43)*, 2.16 *(3.48)*, 3.28 *(5.28)*, 3.78 *(6.08)*, 4.29 *(6.90)*, 4.94 *(7.95)*, 9.57 *(15.40)* **Clutch** multiple wet disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2072 engine rpm and 1000 rpm at 2086 engine rpm **Unladen tractor mass** 14950 lb *(6781 kg)*

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1007 rpm)					
111.59 *(83.21)*	2100	6.36 *(24.09)*	0.397 *(0.241)*	17.53 *(3.45)*	
VARYING POWER AND FUEL CONSUMPTION					
111.59 *(83.21)*	2100	6.36 *(24.09)*	0.397 *(0.241)*	17.53 *(3.45)*	Air temperature
99.53 *(74.22)*	2203	5.99 *(22.69)*	0.419 *(0.255)*	16.61 *(3.27)*	75°F *(24°C)*
75.63 *(56.39)*	2232	5.04 *(19.10)*	0.464 *(0.282)*	14.99 *(2.95)*	Relative humidity
50.96 *(38.00)*	2256	4.14 *(15.67)*	0.565 *(0.344)*	12.31 *(2.43)*	37%
25.99 *(19.38)*	2278	3.10 *(11.75)*	0.831 *(0.506)*	8.37 *(1.65)*	Barometer
1.31 *(0.98)*	2299	2.20 *(8.32)*	11.666 *(7.096)*	0.60 *(0.12)*	28.99"Hg *(98.17 kPa)*

Maximum Torque 395 lb.-ft. *(536 Nm)* at 1301 rpm
Maximum Torque Rise 41.7%
Torque rise at 1702 engine rpm 18.1%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F (°C) cool-ing med	Temp.°F (°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—9th Gear									
93.52 *(69.74)*	8465 *(37.65)*	4.14 *(6.67)*	2108	3.43	0.473 *(0.288)*	14.70 *(2.90)*	193 *(89)*	66 *(19)*	28.94 *(98.00)*
75% of Pull at Maximum Power—9th Gear									
74.34 *(55.44)*	6354 *(28.26)*	4.39 *(7.06)*	2207	2.38	0.521 *(0.317)*	13.36 *(2.63)*	189 *(87)*	66 *(19)*	28.94 *(98.00)*
50% of Pull at Maximum Power—9th Gear									
50.64 *(37.76)*	4234 *(18.83)*	4.49 *(7.22)*	2240	1.64	0.625 *(0.380)*	11.13 *(2.19)*	185 *(85)*	66 *(19)*	28.94 *(98.00)*
75% of Pull at Reduced Engine Speed—11th Gear									
74.38 *(55.46)*	6335 *(28.18)*	4.40 *(7.09)*	1698	2.30	0.456 *(0.277)*	15.27 *(3.01)*	189 *(87)*	66 *(19)*	28.94 *(98.00)*
50% of Pull at Reduced Engine Speed—11th Gear									
50.63 *(37.76)*	4239 *(18.86)*	4.48 *(7.21)*	1713	1.64	0.514 *(0.313)*	13.53 *(2.67)*	183 *(84)*	66 *(19)*	28.94 *98.00*

DRAWBAR PERFORMANCE
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F (°C) cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
				5th Gear					
82.40 *(61.45)*	14507 *(64.53)*	2.13 *(3.43)*	2178	13.90	0.527 *(0.320)*	13.21 *(2.60)*	186 *(85)*	62 *(17)*	28.90 *(97.87)*
				6th Gear					
90.55 *(67.52)*	13528 *(60.17)*	2.51 *(4.04)*	2147	9.28	0.490 *(0.298)*	14.19 *(2.79)*	188 *(86)*	64 *(18)*	28.91 *(97.90)*
				7th Gear					
93.33 *(69.60)*	12005 *(53.40)*	2.92 *(4.69)*	2108	6.75	0.474 *(0.288)*	14.69 *(2.89)*	190 *(88)*	66 *(19)*	28.94 *(98.00)*
				8th Gear					
93.21 *(69.51)*	9782 *(43.51)*	3.57 *(5.75)*	2109	3.99	0.473 *(0.288)*	14.70 *(2.89)*	192 *(89)*	65 *(18)*	28.94 *(98.00)*
				9th Gear					
93.52 *(69.74)*	8465 *(37.65)*	4.14 *(6.67)*	2108	3.43	0.473 *(0.288)*	14.70 *(2.90)*	193 *(89)*	66 *(19)*	28.94 *(98.00)*
				10th Gear					
93.38 *(69.63)*	7400 *(32.92)*	4.73 *(7.62)*	2109	2.62	0.474 *(0.288)*	14.68 *(2.89)*	192 *(89)*	63 *(17)*	28.93 *(97.97)*
				11th Gear					
93.29 *(69.57)*	6414 *(28.53)*	5.45 *(8.78)*	2099	2.30	0.472 *(0.287)*	14.75 *(2.91)*	191 *(88)*	63 *(17)*	28.95 *(98.04)*
				12th Gear					
90.85 *(67.75)*	5403 *(24.03)*	6.31 *(10.15)*	2109	1.97	0.486 *(0.296)*	14.32 *(2.82)*	192 *(89)*	63 *(17)*	28.95 *(98.04)*
				13th Gear					
89.72 *(66.91)*	4619 *(20.54)*	7.29 *(11.72)*	2105	1.72	0.492 *(0.299)*	14.14 *(2.79)*	192 *(89)*	64 *(18)*	28.94 *(98.00)*
				14th Gear					
88.11 *(65.71)*	3992 *(17.76)*	8.28 *(13.32)*	2104	1.56	0.500 *(0.304)*	13.93 *(2.74)*	192 *(89)*	64 *(18)*	28.94 *(98.00)*

TRACTOR SOUND LEVEL WITH CAB	**Front Wheel Drive Disengaged dB(A)**	**Engaged dB(A)**
Gear closest to 4.7 mph *(7.5 km/h)* 10th Gear	71.0	72.0
Maximum sound level	72.5	73.0
Transport speed 19th Gear	76.5	—
Bystander 19th Gear	83.0	—

TIRES, BALLAST AND WEIGHT

	Tested Without Ballast
Rear Tires—No., size, ply & psi *(kPa)*	Four 18.4R38; **; 16 *(110)*
Front Tires—No., size, ply & psi *(kPa)*	Two 13.6R28; ***; 23 *(160)*
Height of Drawbar	19.5 in *(495 mm)*
Static Weight with Operator—Rear	10002 lb *(4537 kg)*
—Front	5114 lb *(2319 kg)*
—Total	15116 lb *(6856 kg)*

REPAIRS AND ADJUSTMENTS: The fuel filter was replaced due to leakage caused by a faulty seal in the filter.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 157° F *(69°C)*. This tractor did not meet manufacturers claim of 72.0 dB(A) cab sound level. The performance results on this summary were taken from OECD tests conducted under the Code II Restricted Standard Test Code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1665**, Summary 132, July 26, 1993.

LOUIS I. LEVITICUS
Engineer-in-Charge

L.L. BASHFORD
R.D. GRISSO
K. VON BARGEN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE (FRONT DRIVE DISENGAGED)
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F (°C) cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—11th Gear									
93.02 *(69.37)*	6421 *(28.56)*	5.43 *(8.74)*	2105	2.83	0.473 *(0.288)*	14.70 *(2.90)*	191 *(88)*	63 *(17)*	28.93 *(97.97)*
75% of Pull at Maximum Power—11th Gear									
73.72 *(54.98)*	4812 *(21.40)*	5.75 *(9.25)*	2205	2.18	0.527 *(0.320)*	13.21 *(2.60)*	188 *(87)*	66 *(19)*	28.94 *(98.00)*
50% of Pull at Maximum Power—11th Gear									
50.29 *(37.50)*	3216 *(14.31)*	5.86 *(9.44)*	2237	1.43	0.638 *(0.388)*	10.90 *(2.15)*	184 *(84)*	66 *(19)*	28.94 *(98.00)*
75% of Pull at Reduced Engine Speed—13th Gear									
73.78 *(55.02)*	4815 *(21.42)*	5.75 *(9.25)*	1670	2.18	0.467 *(0.284)*	14.89 *(2.93)*	189 *(87)*	66 *(19)*	28.94 *(98.00)*
50% of Pull at Reduced Engine Speed—13th Gear									
50.34 *(37.54)*	3217 *(14.31)*	5.87 *(9.44)*	1694	1.52	0.530 *(0.322)*	13.13 *(2.59)*	183 *(84)*	66 *(19)*	28.94 *(98.00)*

MAXIMUM POWER IN SELECTED GEARS

7th Gear									
85.23 *(63.56)*	11532 *(51.30)*	2.77 *(4.46)*	2162	13.67	0.519 *(0.316)*	13.41 *(2.64)*	188 *(86)*	62 *(17)*	28.90 *(97.87)*
8th Gear									
91.02 *(67.87)*	9789 *(43.54)*	3.49 *(5.61)*	2108	6.33	0.488 *(0.297)*	14.27 *(2.81)*	193 *(89)*	65 *(18)*	28.94 *(98.00)*
9th Gear									
92.67 *(69.10)*	8486 *(37.75)*	4.10 *(6.59)*	2107	4.50	0.477 *(0.290)*	14.59 *(2.87)*	192 *(89)*	65 *(18)*	28.94 *(98.00)*
10th Gear									
92.96 *(69.32)*	7430 *(33.05)*	4.69 *(7.55)*	2107	3.31	0.477 *(0.290)*	14.60 *(2.88)*	192 *(89)*	63 *(17)*	28.93 *(97.97)*
11th Gear									
93.02 *(69.37)*	6421 *(28.56)*	5.43 *(8.74)*	2105	2.83	0.473 *(0.288)*	14.70 *(2.90)*	191 *(88)*	63 *(17)*	28.93 *(97.97)*
12th Gear									
90.73 *(67.66)*	5426 *(24.14)*	6.27 *(10.09)*	2106	2.34	0.485 *(0.295)*	14.35 *(2.83)*	192 *(89)*	63 *(17)*	28.95 *(98.04)*
13th Gear									
89.90 *(67.04)*	4650 *(20.68)*	7.25 *(11.67)*	2102	2.01	0.492 *(0.299)*	14.15 *(2.79)*	192 *(89)*	63 *(17)*	28.95 *(98.04)*
14th Gear									
88.15 *(65.74)*	4013 *(17.85)*	8.24 *(13.26)*	2099	1.76	0.498 *(0.303)*	13.96 *(2.75)*	192 *(89)*	64 *(18)*	28.94 *(98.00)*

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III
Quick Attach: Walterscheid lower link ends

Maximum Force Exerted Through Whole Range:	10161 lbs	*(45.2 kN)*
i) Opening pressure of relief valve:	NA	
Sustained pressure with pump stalled:	2880 psi	*(198 bar)*
ii) Pump delivery rate at minimum pressure:	26.2 GPM	*(99.2 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	24.5 GPM	*(92.7 l/min)*
Delivery pressure:	2570 psi	*(177 bar)*
Power:	36.7 HP	*(27.4 kW)*

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. *(bar)*	2880 *(198)*
Location	remote outlet
Hydraulic oil temperature °F *(°C)*	144 *(62)*
Location	hydraulic sump
Category	IIIN
Quick attach	No

With lift cylinders—2 × 70 mm

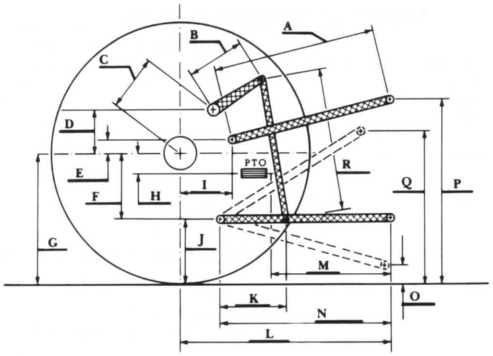
Hitch point distance to ground level in *(mm)*	7.9 *(201)*	16.0 *(406)*	24.0 *(610)*	32.0 *(813)*	40.0 *(1016)*
Lift force on frame lb.	10514	10436	10111	9384	7910
Lift force on frame *(kN)*	*(46.8)*	*(46.4)*	*(45.0)*	*(41.7)*	*(35.2)*

With lift cylinders—1 × 70 mm and 1 × 80 mm

Hitch point distance to ground level	8.1 *(206)*	16.0 *(406)*	24.0 *(610)*	32.0 *(813)*	40.0 *(1016)*
Lift force on frame lb	11959	11949	11605	10760	9168
Lift force on frame *(kN)*	*(53.2)*	*(53.2)*	*(51.6)*	*(47.9)*	*(40.8)*

With lift cylinders—2 × 80 mm

Hitch point distance to ground level in *(mm)*	7.7 *(196)*	16.0 *(406)*	24.0 *(610)*	32.0 *(813)*	40.0 *(1016)*
Lift force on frame lb.	13295	13718	13295	12303	10426
Lift force on frame *(kN)*	*(59.1)*	*(61.0)*	*(59.1)*	*(54.7)*	*(46.4)*



HITCH DIMENSIONS AS TESTED—NO LOAD

	OECD test inch	OECD test *mm*	SAE test inch	SAE test *mm*
A	27.2	*692*	26.6	*676*
B	14.8	*375*	14.8	*375*
C	24.5	*623*	24.5	*623*
D	23.1	*588*	23.1	*588*
E	11.1	*283*	7.5	*190*
F	10.8	*275*	10.8	*275*
G	35.6	*905*	34.3	*870*
H	4.1	*105*	4.1	*105*
I	19.8	*504*	19.8	*504*
J	24.8	*630*	23.4	*595*
K	24.1	*612*	23.1	*587*
L	47.5	*1206*	46.4	*1179*
M	23.1	*586*	22.0	*559*
N	39.8	*1011*	38.7	*984*
O	9.0	*229*	8.0	*203*
P	51.8	*1315*	45.4	*1153*
Q	38.8	*984*	36.8	*933*
R	38.1	*968*	35.9	*911*

JOHN DEERE 7600 POWERSHIFT DIESEL

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